GARDEN AND FOREST.

PUBLISHED WEEKLY BY

THE GARDEN AND FOREST PUBLISHING CO.

Office: Tribune Building, New York.

Conducted by . . . . . Professor C. S. Sargent.

ENTERED AS SECOND-CLASS MATTER AT THE POST OFFICE AT NEW YORK, N. Y.

NEW YORK, WEDNESDAY, OCTOBER 3, 1888.

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The Artistic Aspects of Trees.—IV.

FORM, texture and color—these we have noted as the three qualities to be considered when trees are studied for their artistic value.

If, in ornamental planting, we used only the materials which nature supplies in the neighborhood of our homes, no one of these qualities would seem of more interest in the planter's eye than the others, or would offer him more chances of making mistakes. But, as a result of the efforts of generations in introducing exotic species of trees and in perpetuating casual natural eccentricities as well established varieties, color has been brought into greater relative prominence in the nursery than it assumes in nature's workshop. The planter is therefore more apt to be struck by varieties of color than by those of form and texture; and as a rule thinks more of the effects which he can produce with them, and commits with them his most frequent and conspicuous mistakes. If a true artist could always be employed when a work of landscape gardening is in question, then the development of our numerous and striking nursery varieties of color—which include tones of purple, red, blue, white, and especially yellow in a score of different degrees, and many striped and mottled effects as well—might be counted wholly fortunate; for, of course, the wider the range of an artist's palette, the more numerous will be the kinds of beauty he can produce. But color is the most difficult of qualities to manage, the most revengeful when managed wrongly; and, in the hand of the ordinary planters the varied material of to-day means merely a greater confusion of tints, a more painful degree of unrest, spottiness and ugliness, than would have been achieved had the materials from the neighboring woods been adhered to. Too often, in small grounds especially, it seems as though the aim had been to do away as far as possible with medium green tones and to set upon a carpet of vivid emerald turf as many trees of strong eccentric hue as could be collected. Even when the general tone of the landscape is pretty well preserved and bright or variegated trees and shrubs are used simply as accents here and there, too little thought is given to placing them where they will be emphatic yet not disturbing, too little to the question of their beauty as distinct from their mere novelty or eccentricity. As a rule it is better to avoid striking colors altogether and keep to the quiet medium tones of green. These offer variety enough to satisfy a cultivated eye in the majority of cases; and if an emphatic note is really needed, it can be supplied, where the general effect is softly harmonious, by means of something less brilliant than a Golden Poplar or a Purple Beech. Such trees as these have their place in gardening art; but an amateur's eye is hardly the one which can be trusted to find it. For the amateur, in short, the safest course is the best one to follow, although it may not be the one which an artist will always follow in his search for the highest and most individual kinds of beauty. If a dull tree stands where a bright one would have produced a better effect, we may feel that a chance has been missed. But if a bright one stands where harmony required a dull one, then we feel that an actual sin against good taste has been committed.

The art of the gardener has likewise greatly increased variety in the forms and in the textures of trees, giving us pyramidal and weeping shapes, and finely cut or fringed foliage, in a perpetually increasing flood of "novelties." Here again the amateur is apt to be seduced into thinking that novelty means excellence, that eccentricity means charm; is apt to plant what he selects without regard to harmony of general effect, and to select in the interests of curiosity rather than of a love for genuine beauty. And here again it may be said that the safest course is the wisest one to follow. Normal shapes can hardly be so distressing, however they may be combined, as abnormal ones are sure to be if there is the slightest error in their combination.

Of form it may, furthermore, be said that a tree is not well understood until it is understood in all the stages of its growth. The typical shape of a young tree often differs very greatly from the typical shape of the same tree at maturity, and this again from its typical shape in old age; and, in planting, regard must be paid to the question whether an immediate effect or a long-postponed effect ought to be most considered. For example, a tree set in isolation on a lawn in full view from the house ought to be beautiful in youth and at the same time give promise of beauty (perhaps of a different kind but still appropriate) in later years; whereas in planting a belt or wood in the distance, the principal trees should be so chosen that they will look better and better the older they grow, while present effect may be chiefly considered in others which are destined to be cut as development progresses.

Texture varies less with the passage of years than form. Color is practically persistent year after year, but varies from month to month; and this fact should also be borne in mind. There are some trees, like the Yellow-wood, for instance, which are of a medium tint in the middle of summer, but of a yellowish green in spring, and it is unwise to place them where during a few weeks they will not look well, even if later on they assume a harmonious hue. Autumn effects should also be more carefully considered than they are; but to speak of the possibilities which are open to an intelligent planter in this direction would require a long chapter instead of an incidental paragraph.

Large Palms and other tropical plants grown in tubs or large pots are now often used in this country for the decoration of the lawns of country places or of some of the fashionable cemeteries, where costly glass-houses are maintained on purpose to store these plants in winter. No system of garden-decoration is more expensive, while few of the devices of modern gardening are more displeasing or unsatisfactory in their results. Palms, with very few exceptions, when placed out-of-doors in this climate soon become shabby; the foliage is torn and injured by the slightest storm, and having been produced in a damp and shaded atmosphere, soon turns yellow when exposed to the full blaze of the sun. But the most perfect specimen looks out of place on one of our northern lawns. It injures

the appearance of the trees and shrubs with which it is thus brought in contact, while these quite destroy the beauties of the Palm. Contrast of this sort is not beauty, and the result must always be unfortunate. Such plants have no place in the cemetery; and the money they cost could be directed with greater advantage in caring for hardy trees, and for the grass, which is too often neglected in such places. In private gardens they are appropriate and splendid objects for the summer-decoration of protected terraces and piazzas, as their graceful lines harmonize always when brought into close connection with architecture; but the true way to enjoy Palms and many other plants as well in this country is in a summer conservatory or tent, which can be spread over a terrace or a portion of the lawn in immediate connection with the house. Such a tent can be made to supplement the house in a delightful manner, forming an out-door apartment in which Palms and other foliage plants will thrive, and in which many flowers show their greatest beauty. Such a tent can be made attractive here during five months, and in such tents the tropical plants which are now allowed to disfigure, during the summer, many a fair scene should be gathered for their own and for their owners' good. But incongruous and out of place as Palms look in an American landscape, the effect produced by planting Agaves, almost universally called Aloes here, upon the turf of a lawn, is even worse; and when a number of these plants are packed close together in a circular bed the effect is grotesque beyond description. These, of all plants, are the most architectural in outline. Naturally they grow in a country and in situations so dry that there is never a vestige of grass near them. Standing out among the dry, bare, sun-scorched rocks of the Mexican mountains, they are often beautiful objects, filling the traveler with amazement and delight; but an Agave growing out of a trimly-mown lawn of grass is something which the imagination of a person who had only seen these plants as nature displays them could never picture. But they have their use in our modern gardens. No other plant can so appropriately or handsomely decorate the balustrade of a terrace or the steps of a great building. Whenever they can be used directly in connection with buildings they are in the right place. No other plants which can be properly used in such situations can so well support the heat and drought which full exposure to the sun entails, and there are no plants which, when used in such situations, give such universal satisfaction. It is evident that the decoration of gardens can never attain to its greatest possibilities until plants are more generally studied than at present in their homes, and in special relation to their natural surroundings.

Central Park, Minneapolis.

WHAT is now Central Park, Minneapolis—a pleasure-ground for pedestrians only, of some thirty acres in extent, in one of the best residence quarters of the city and surrounded by costly houses—was, no longer than four years ago, a piece of low, undrained pasture land. On one side of this pasture was a pond-hole, perhaps a hundred feet in diameter, surrounded by a broad margin of bogs, and from this the water oozed through marshy ground, over which it was hardly possible to walk dry-shod at any season. Upon the area through which the pool found its outlet, as well as upon its borders, there was neither tree nor shrub until three years ago, when the park planting was begun, and the swift transformation which has been effected here can be partly understood from the illustration on page 379, which gives a view of a portion of this marsh as it now appears. The pool and bog were excavated to form a lake, four acres in extent, and some of the earth was used to construct in it an irregular island. In addition to the natural springs found here, an artesian well was sunk from which three hundred gallons of pure water are delivered every minute, so that the lake is well supplied with living water. That no hint of artificiality appears, however, either in the island or the lake, can be well imagined from the natural treatment of the shores, as seen in the illustration.

The view is taken from a point on the lake-shore opposite to the lower extremity of the island, and looking through a narrow channel between the shores of the island and the lake, with the island on the left. Above the island the opposite shores of the lake approach each other until they are near enough together to be spanned by the bridge shown in the illustration, while the larger portion of the lake lies still beyond The shrubs, which are massed so effectively on either shore, were taken from neighboring swamps and woods three years ago. Conspicuous among them is the Red-berried Elder, whose arching branches admirably fit it for a position on the border of the water. Among other shrubs which overhang the lake are Sumachs and Red-twigged Dogwoods, while further back are Snowberries, Button-bushes and other wild shrubs. The tops of distant trees, which form a portion of the sky-line, are on the further shore of the lake. These trees were also taken from neighboring woods, and, although they were large specimens, they have been so well cared for that their growth, like that of the shrubbery, has been exceptionally strong. When it is considered that artificial lakes and islands are always counted difficult of construction if they are to be invested with any charm of naturalness, the success of this attempt will not be questioned, while the rapidity with which the artist's idea has grown into an interesting picture is certainly unusual.

This park was designed by Mr. H. W. S. Cleveland.

On a Sand Ridge in California.

ONE day, about the first of June, 1888, I wandered in search of wild grasses to the summit of one of the foot-hills of the Santa Cruz range of mountains, some six miles back from the coast. It was a sandy hill, seemingly barren, but rising out of the white earth were many plants, undoubtedly natives, in the full glow of summer growth. This ridge, and in fact most of these mountains, are composed of sandstone, shale, and diatomaceous earth—a stratified oceanic deposit. Here we find fragments of shells, bits of bones of marine mammalia, teeth of sharks, fragments of echinoderms, etc. In the shale, or "chalk rock," as it is commonly called, are immense quantities of a few species of diatoms, and spicules of sponges. There is enough lime, magnesia, and the like, to act as a slight cement in holding the particles together. Some of the "shale," however, has a flinty hardness, and looks much like flint. It contains some silex and aluminum.

There are numerous perennial springs of cold water among these hills. In some places there are bituminous oozings, and occasionally a mountain-spur of sandstone completely saturated with asphaltum. This material is used quite extensively now for covering the streets and sidewalks of our towns and cities. It answers an excellent purpose, because it is indestructible, and a good material to walk or drive over.

Wherever there are valleys or basins there are trees of all sizes, and many species, from the Manzanita, four or five feet high, to the tall Redwood, 100 to 200 feet high. Geologically all this region belongs to a comparatively recent period. The fossils are mostly of the same species as those now living in the Bay of Monterey.

Of the plants growing on this apparently barren sand ridge I might make a long list—much longer than would at first seem possible. Within fifty steps of where I stood on the summit of the little sand ridge I noted with my pencil about twenty-five species. I did not stoop to examine the smaller kinds.

I will mention a few of the most attractive. A species of Ceanothus (*C. cuneatus*), or "Lilac," as it is known in

California. It is a very pretty spreading shrub, six to eight feet high, with smooth, thick, reticulate-veined leaves, one-half to one inch long, often with a notch at the apex, darkish green above and glaucous underneath. The flowers are in globular clusters about one inch in diameter, white or pale blue, and fragrant. When in bloom it is a charming shrub as it grows on these hills. Another bush touching the Ceanothus is a Manzanita (*Arctostaphylos tomentosa*). It is an evergreen and exceedingly variable plant, no two being of the same color of foliage. Chameleon-like, it varies with season, locality and stages of growth. Its dark reddish trunk (most frequently in clusters) is always gracefully crooked and ornamental. In June the flowers have all disappeared, and the little berries, one-fourth to one-half inch in diameter (little apples, their name signifies in Spanish), green, red and brown in color, hang in pretty clusters among the old and new leaves.

In such places the California Poppy (*Eschscholtzia Californica*), is seldom wanting, and it was present here with its inimitable yellow flowers on long stems, which generally find support among the branches of some dwarf shrub, such as the Chamisal (*Adenostoma*).

I found here, also, a very pretty Cichoriaceous plant in full bloom (*Malacothrix obtusa*), with its radical leaves spreading on the clear sand, and scape-like, branching stems bearing beautiful yellow flowers, next in richness to the Poppy. I brought home some of these, which continued for two weeks to open out each day and close at night their pretty flowers.

Among the several grasses I will mention the one most prominent; a beautiful and stately Blue grass, *Poa tenuifolia* of Nuttal. It is beautiful because so unexpected and out of place in such a locality. Growing in bunches, two or three feet high, with numerous slender, often purplish leaves, it tempts one to try the experiment of planting a lawn, or making a Blue Grass farm on some of these sand ridges! More improbable things have been done; for instance, in Golden Gate Park, in San Francisco, where roving sand hills and Alaska winds have been tamed down to gentle slopes and genial breezes, by the aid of certain trees for wind-breaks, and a skillful selection of other plants adapted to the holding of the sand and staying the air currents.

At present our sand ridge only serves the slightly useful purposes of keeping pure the native plants, of storing up some heat from the sun during the day to temper the night breeze, and producing a few mouthfuls of forage for grazing cattle.

What its full capabilities are, must remain for future experiment. It is certain a vineyard can flourish there, for that has been demonstrated near by. Some day probably certain forest trees may grow on these sand slopes, to supply timber for future generations, to preserve and equalize the water supply, and to protect orchards and farm-lands from the too violent sweep of winds that sometimes blow from the north and west.

Santa Cruz, Cal., July, 1888. *C. L. Anderson.*

Foreign Correspondence.

London Letter.

THERE was an abundance of flowers to-day, for the most part from the open air, at the meeting of the Royal Horticultural Society, and the unusually large number of first-class certificates awarded is proof of the excellence of the novelties. The chief feature of the exhibition was a magnificent display of Gladioli from the famous growers, Messrs. Kelway, of Langport, in Somersetshire. I do not know whether *Gladiolus Gandavensis* is grown much in America, though I imagine that they could be grown to perfection in your hot summers. If they are not, they should be, for there are few flowers that can surpass the splendor and the stateliness of a perfect Gladiolus, such as James Kelway can produce. Of the 500 spikes displayed not one was under eighteen inches in length, and every one carried a score or more of expanded flowers and buds, every flower being three to even four inches across, as perfect in form as the most exacting florist could desire. The colors of these Gladioli have an extremely wide range, showing every gradation of tint, from the most glowing scarlets and crimsons through the most exquisite shades of pink to the purest of whites. Some are penciled, lined, flaked and blotched in the most subtle way, and all have their petals of wax-like texture, the crystalline cells of which sparkle on their surface like gems. This is not an overdrawn picture of what Kelway's Gladioli are to-day, and I thought, when admiring them this morning, how odd it is, not to say perverse, that flowers of such marvelous beauty should be neglected because their market value is not so great as that of Orchids and other expensive tropical flowers. Of the hundreds of spikes shown to-day the majority represented old varieties, but a large number of new seedlings were shown for certificates, and of these the Committee selected the following six sorts: Cebes, brilliant cherry-crimson, quite a new tint; Magas, white, delicately penciled with pink; Micon, upper segments blush white, flaked with pink, lower segments pale primrose-yellow, a distinct break in color; Accia, vivid scarlet, with lower segment white; Bullion, pale yellow, flaked delicately with carmine, and Mago, carmine-crimson, with white lower segment. All these have massive spikes and large flowers of perfect form. Others could have been chosen that worthily deserved a like award, but the principle is not to be too lavish with certificates For the next two or three meetings Messrs. Kelway will show an array of Gladioli such as this from their broad acres at Langport.

Double Begonias, from Messrs. Cannell, of Swanley, were another feature to-day. A large group of new seedlings were shown, all with flowers as double, and, in many instances, as large as good double Hollyhocks, but only two were chosen for certificates; one, named Mrs. Lynch, with rosetted flowers, four inches across, of a clear rose-pink, and Mrs. Lascelles, very large and double, pale cherry-carmine. These both have vigorous growth and good habit. From Swanley also came some new single Begonia, and the Committee found themselves bound to deviate from the usual rule in not certificating seedling single Begonias for the sake of one called White Lady, whose flowers were of such faultless shape—that is, they were almost, if not quite, circular, and of snowy whiteness—in fact, it is one of the best, if not the purest, white single Begonia yet raised. Among the others were some with orange-red or flame-colored flowers, which were very showy.

For the first time this year Messrs. Cannell sent a selection of the splendid new varieties of Canna, to which I have referred in one of my former letters. Those shown made an exceedingly fine display, and the large, bold-looking foliage, like small Banana-leaves, seemed to set off the glowing colors of the flowers to great advantage. The curious, unsymmetrical form of Canna flowers adds to their beauty, and the uninitiated public look upon them as Orchids. Four Cannas, the pick of a large group, were certificated. These all rejoiced in French names, thus indicating their origin. Admiral Courbet has large flowers, with bright yellow petals, heavily and profusely blotched and spotted with blood-red; Capricieux has flowers with bright orange-red petals, conspicuously and prettily edged with golden-yellow, a most striking sort; Francisque Morel has flowers of a deep crimson, and Madame Just I should describe as nankeen color, it being that peculiar mixture of red and yellow that nobody can intelligibly describe. To these four I should have added one called Felix Crousse, also with singular orange-red flowers. These hybrid Cannas are unquestionably the coming flowers, as they are invaluable for winter bloom. With a little management they can be made to bloom in summer and winter continuously. At Swanley they are grown in an

intermediate temperature, planted out in free soil in a long, narrow, span-roofed house.

Dahlias have made their first appearance at the meetings, and for the next two months we shall be surfeited with novelties among them. To-day there were many new sorts put before the committee, but very few were considered good enough for a certificate. In my estimation the finest sort, and one that will prove of most value in the garden because of its distinct color, is one called Beauty of Brentwood. It belongs to the so-called Cactus Dahlias, and has flowers of the same size and shape as *D. Juarezii*, but the color, instead of scarlet, is a beautiful shade of carmine, or perhaps some would say, carmine-magenta. It is certainly a most telling flower, and one that will make its mark. It received a unanimous vote. Two single Dahlias from Messrs. Cheal, of Crawley, won certificates. One was Victoria, with white florets edged broadly with deep red, the other with broad flat florets of a pale pink edged with buff—a most strange combination of colors, hence its value as a break; but as it only won a certificate by a majority of two votes, you may glean that it did not please every one.

The pretty little white *Campanula isophylla alba* was awarded a certificate. It is not a novelty, but was particularly well grown and flowered. It is a beautiful plant for a suspended pot in a green-house or window, but is not quite hardy in England in the open air.

Mr. B. S. Williams made a fine display of Orchids in flower, and one was singled out for a certificate. This was the rather rare *Odontoglossum Karwinskii*. It has a long flower spike, dull-colored sepals and petals, and a broad labellum colored with various shades of reddish purple, but it is not what one would call an attractive Orchid. Mr. Williams' group was rich in Orchids that flower at this season, the rarest among them being *Cypripedium Sanderianum*, *C. porphyreum lessellatum*, *C. Ashburtoniæ*, var. *superbum* (new and beautiful), *C. Ashburtoniæ expansum*, *Cattleya aurea*, *Pachystoma Thompsonianum* (a great rarity and very pretty), *Cattleya Eldorado alba* and *splendens*, *Cypripedium œnanthum superbum*, *Dendrobium Goldiei*, all of which are worth making a note of as being among the finest of the comparatively few Orchids that flower in the latter half of August. Two new Maidenhair Ferns were shown also by Mr. Williams. One was *Adiantum colpodes roseum*, which has its young fronds of a coppery red hue, the other a crested fronded variety of *A. Capillus-Veneris* named *A. Versaillense*, a crested, parsley-like Fern. This was awarded a certificate, but the vote was not unanimous. One of the several new varieties of Delphinium shown by Messrs. Kelway won a certificate. It is called Horus, and has a massive spike of large flowers, deep indigo blue, centered with white.

London, August 24th. *W. Goldring.*

New or Little Known Plants.

Rhododendron (Azalea) Vaseyi.

AMONG the additions which have been made of late years to the Flora of the United States, few plants have a greater scientific and horticultural interest than the beautiful Rhododendron figured upon page 377 of the present issue of this journal. Its nearest American ally is the Rhodora. In eastern Asia, however, there are two or three species of Rhododendron, with the campanulate, irregularly bilabiate corolla which characterizes Rhodora and this species, which is very like the sub-alpine Japanese, *R. Albrechti*. The discovery, therefore, of *R. Vaseyi* added, as Professor Gray at once pointed out, "another to the now very numerous cases of remarkable relationship between the China-Japanese and the Alleghanian floras." *Rhododendron Vaseyi* has been so fully described, that it is only necessary to add to Professor Gray's and Mr. J. Donnell Smith's remarks* upon this plant that Mr. Faxon, from whose drawing our illustration is made, notices that the upper or posterior lobe of the corolla is exterior in the expanded flower, a peculiarity we have been unable to detect in the flowers of any other Rhododendron.

R. Vaseyi is a tall shrub with slender branches, fifteen to eighteen feet high, with bright, clear pink, precocious flowers, marked towards the base of the upper lobes of the corolla with numerous darker spots. They are quite unlike in color, and appear much earlier than those of other American Azaleas. *R. Vaseyi* was discovered by Mr. George R. Vasey, in 1878, near Webster, in Jackson County, North Corolina; it was afterward found in Cashier's Valley, South Carolina, directly in the rear of the house long occupied, during the summer months, by the Hampton family, where it grows in great luxuriance with *R. arborescens*, occupying the low banks of a small stream; and during the present season it has been found again, this time by Mr. S. T. Kelsey, upon Grandfather Mountain, in North Carolina, only two or three miles from Louisville, "growing everywhere in clumps and patches on the southern and south-eastern slopes, at 4,500 to 5,000 feet elevation, but most abundant and vigorous in moist situations, and is associated with *R. maximum*, *R. Catawbiense* and *Kalmia latifolia*." *R. Vaseyi* takes readily to cultivation, flowering freely when not more than a foot high, and promises to be perfectly hardy in the climate of Boston. *C. S. S.*

* *Rhododendron Vaseyi*, A. Gray, *Proc. Am. Acad.*, xv. 48; *Bot. Gazette*, viii. 282.—John Donnell Smith, *Bull. Torrey Bot. Club*, xv., 164.

Kœlreuteria bipinnata.

MONSIEUR FRANCHET contributes an interesting account, accompanied with an illustration of the new Kœlreuteria of western China, to a recent issue of the *Revue Horticole*. It is one of the most important, from a horticultural point of view, of the numerous discoveries of the French missionary, Delavay, who alone, and remote from all Europeans, has been able in the short space of four years to double the number of Asiatic species of certain genera. The field of his observations is a very limited one, not many square miles in extent, yet he has detected in this small region of the mountains of Yunnam no less than thirty-two new Rhododendrons, and as many new Primroses and Gentians.

Kœlreuteria paniculata is a well known, small, ornamental tree from northern China, with large compound leaves, consisting of from six to ten pairs of leaflets and large panicles of yellow flowers, which appear in July. "The new Kœlreuteria," Monsieur Franchet points out, "is entirely distinct, as may be judged from the following description:

"*Kœlreuteria bipinnata*, Franch., *Bull. de la Soc. Bot. de France*, xxxiii., 436, *t.* 93. A very vigorous tree, sixty feet high; leaves twenty-six inches long by twenty-four inches broad at the base, doubly pinnate; pinnæ coriaceous, alternate, distinctly pediceled, nearly glabrous, dark green above, pale on the lower surface, oval-lanceolate, sharply serrate. The flowers resemble those of *K. paniculata;* they are bright yellow in color, the narrowed base of the petals purple, and are produced in enormous, compact panicles. The capsules are broadly oval, always obtuse, sometimes nearly round, two and a half inches long, turning purple when fully ripe. The seeds are black, the size of a small pea.

"*K. bipinnata*, grows in the forest of Ta-ling-tin, above Tapin-tza, in central Yunnam, at an elevation of more than 5,000 feet. It flowers at the end of July, and the fruit is ripe in the autumn.

"It is a remarkable tree on account of the size of its leaves and the abundance of its flowers. In the autumn its appearance is unique with its immense panicles of large purple pods. It is probable that this new species will grow in cultivation as freely as its relative, but the experiment has not been tried yet. The seed germinates freely, and the young plants grow rapidly. Even if the climate of Paris should prove too severe for this tree, it will no

doubt thrive admirably in western and central France."

The climate of Yunnam is probably not very unlike that of the mountainous portions of the southern United States, and there is a probability that many of its plants will grow in the climate of our Middle States, if not further north on the Atlantic seaboard. One of the most interesting of Monsieur Delavay's discoveries is a large evergreen Magnolia, almost identical with *M. grandiflora* of our Gulf States. The behavior of this tree in cultivation will be watched with the greatest interest, as it may be expected to prove much hardier than the American species, which is confined to the sea-coast, and never extends into the mountains, or even the upper middle districts. *C. S. S.*

Fig. 60.—Rhododendron (Azalea) Vaseyi.—See page 376.

Cultural Department.

The Vegetable Garden.

CONTINUED wet weather has caused rank growth in Celery, Cauliflower, Beets, Turnips, and other young crops, and an unusual plumpness in Snap and Lima Beans, and vigor in Corn, but it has been very detrimental to Tomatoes and Melons, causing them to ripen slowly and with a marked tendency to rot. In fact, the whole season has been irregular and backward with several crops. A fair crop of Globe Artichokes is usually due in September from plants raised from seed in early spring, but this season, so far, only two plants among sixty have produced heads.

Prepare for frost. Tomatoes, Snap and Lima Beans, Corn, Cucumbers, Egg Plant, Peppers and Squashes are vegetables that will suffer from the slightest frost. Cauliflower, Brussels Sprouts, Celery, Spinach, Parsley, Peas, Lettuces, Endive, Beets, Carrots, Turnips and Radishes are not injured by slight frosts. But do not handle these crops in frosty weather, no matter how hardy they may be. Have frames, sashes, plant-cloth lights, sheeting, mats or other protecting material at hand for use in case of need. Heavy or cold rains are injurious to Cucumbers at this time of year, therefore it is well to keep covered with sashes all the time and tilt these up a little in the warm part of the day. If any gaps occur in recently sown Spinach rows seed can still be sown in the vacant spaces. The recent heavy rains have packed the soil so firmly, and, in many cases, buried the seed so deeply in the ground, that it has rotted. Have a good stock of young seedling Lettuces to prick off thickly into frames, and half grown plants with which to fill up the frames for winter. Earth up the Celery that is to be used before New Year's, a little at a time, and always in dry weather and when the leaves are perfectly dry; and "handle," that is, draw some earth in around, the late Celery, so as to give the heads a compacted rather than spreading form. In earthing up, pack the earth firmly around the heads so as to exclude water from running down and settling among the leaf stalks. Keep root crops clean and keep the hoe at work among the young Beets, Carrots and Turnips, but do not lift any of these for storing before there is danger of hard frost—that is, about the middle of November here. Gather Squashes under cover in an open airy place where they will be free from frost. Have the Potatoes in a dry, cool place, but where the frost cannot reach them and where it is dark enough to prevent the tubers from becoming green. If cellar room is lacking, Potatoes may be stored in pits out-of-doors, but the pits should be shallow, well ventilated, and covered thinly at first, and so arranged that water will readily drain away from them.

Clear away all dead, dying or spent vegetables, and keep the Melon ground clean from decaying fruit. Melon vines and Potato and Tomato vines should not be thrown into the hog pens, but should be wheeled to the rot-pile, as a foundation for compost; but old Cabbage, Cauliflower, Lettuces, Beans, and all other vegetable matter which pigs are fond of, and which decays quickly, can be thrown into the pens with much benefit to the animals and capital returns in the way of a mass of rich manure. In cutting over Asparagus in November, burn the old stalks to destroy the beetle as far as possible.

Glen Cove, N. Y. *Wm. Falconer.*

Autumn Apples.

FOLLOWING closely the early Apples named in a previous article comes Maiden's Blush, a very handsome Apple, with a waxen skin and a blush that any maiden might envy. The tree is a good grower and yields well; the fruit is generally smooth and perfect, fine for dessert or cooking, and keeps in good condition longer than the earlier sorts. I have kept specimens till January, but only as objects of curiosity, as they lose their flavor after a time. Another fine Autumn Apple, though of an entirely different type, is the Gravenstein, a handsome red striped Apple, of larger size and higher quality than the Maiden's Blush.

The Porter represents another type, being a conical golden yellow Apple, of fair to large size and excellent quality. The tree is an abundant bearer, though hardly as vigorous in growth as the two last named. Its season is from September to October.

The Fall Pippin, when in perfection, for size and excellent

quality is, unquestionably, queen of all the autumn Apples with which I am acquainted. The tree is of spreading habit and good growth, but it does not bear as early or abundantly as the trees already named. The fruit, too, is liable to apple scab, which mars its beauty. Fifty years ago it was grown extensively in this vicinity under the name of the Vanduyne Apple, and I can remember earning my first money with other boys who were employed, at fifty cents a day, to hand-pick the Apple crop of a neighbor and pack the Apples in single-headed barrels, for carting to New York. But the old trees have disappeared, and now it is difficult to find a tree of mature age. Nevertheless, the excellence of the Fall Pippin should insure a place for one tree in the smallest collection of autumn Apples.

A strong competitor of the Fall Pippin is the Orange Apple. The tree is a better grower and much more productive. The fruit is nearly or quite as large, on the average, and fully as handsome, being really "Apples of Gold," smooth and fair to look upon. When first ripe they are a trifle too acid to suit some tastes for dessert use, but when they become mellow the acidity mellows, too, into a most agreeable flavor. This is at all times an excellent cooking Apple and eagerly sought for by all who know it. This Apple has been confounded with the Fall Orange of Massachusetts and the Lowell or Greasy Pippin, which Mr. Downing records as distinct from the Orange, although this name is sometimes given to it. There is also an Orange Pippin grown quite extensively in New Jersey which I think is different, but I am not so familiar with it that I can assert this positively. The Orange Apple, according to Mr. Downing, originated in this State, and is emphatically a New Jersey Apple; in fact, I do not remember of meeting with it elsewhere. Its season is from October to December.

E. Williams.

Montclair, N. J.

Cannas.

EHEMANN'S Canna surpasses others in its magnificent proportions, and in the abundance and persistence of its elegantly disposed, showy flowers. No other plant in the garden displays as great luxuriance in one season's growth. For a mass of it here, twelve feet by forty-five, and now impenetrably thick, and grading from five feet high at the outside to nine feet high in the middle, the plants were set out April 30th, singly, and twenty-four by thirty inches apart, in rich ground. They made very little fresh growth before June, but since then they have grown amazingly, and have been continuously in bloom since early in July. I have never known this Canna to mature seed. When set out the plants consisted of one to three shoots each, and now they show from five to eleven stalks to each clump. Last fall, when it was touched by frost, I cut it over at the ground, and, in order to secure a large stock, at once divided the crowns into as many pieces as there were eyes, and these were planted quite close together in a frame heated in winter by a hot water pipe enough to keep frost out, and were left there till planted out. While they were in the frame their leaves were cut back two or three times before planting-time, as they were growing up against the glass, but it did them no harm, and when the plants were set out they were fairly well rooted. All new and rare Cannas can be treated in the same way.

The old forms, such as Warscewiczii, Discolor, and the like can be stored on a dry shelf in the cellar, and left there from November till April unmoved, but we cannot keep *Canna Ehemanni* in that way. It will not bear to be completely dried off with impunity, nor will *Canna flaccida*.

Premices de Nice is the best tall-growing, yellow-flowered Canna. It bears branched spikes of clear yellow blossoms that rise well above the foliage. Nouttoni forms a grand companion plant to Ehemann's, but it does not grow so tall nor has it such massive foliage. Its flowers are large, showy, and of a rich crimson color. Adolph Weick is another brilliant-flowered sort, but of more compact habit than those already mentioned. If fine foliage is desired more than blossoms we have nothing better than Robusta perfecta.

Within the last few years a new race of Cannas, popularly known as Gladiolus-flowered Cannas, has appeared. They are of quite dwarf or of moderate size, and have deep green, glaucous green, or bronzy crimson foliage. The flowers are unusually large and of many shades of yellow, terra cotta, orange, crimson and crimson-scarlet, and are really showy and beautiful. Emile Leclaire is a good representative of this class. It has large, golden-yellow flowers, spotted with crimson and scarlet, and pea-green foliage.

In the great flower fields at Queens the other day I noted a large assortment of these handsome Cannas in bloom. Among them were:

Admiral Courbet.—Green foliage; flowers large, yellow, with reddish-brown markings. This variety was awarded a first-class certificate by the Royal Horticultural Society at London, August 28th last.

Francisque Morel.—Green foliage; and showy, vivid scarlet-crimson flowers. This variety received a similar award by the same Society, and at the same meeting, as did the last named.

Edouard André.—Crimson foliage; deep red flowers.

Gerard Audran.—Green foliage; flowers reddish or terra cotta color.

François Lapente.—Crimson-shaded foliage; dark purple stems, vivid red-crimson flowers.

Guillaume Coustou.—Green foliage, very strong; flowers yellow, spotted with red, fine.

Revol-Massot.—Green foliage; rich reddish-crimson flowers, streaked with yellow.

Princess de Lusignan.—Green foliage; reddish or terra cotta colored flowers.

General de Neigrier.—Crimson foliage; crimson-scarlet flowers.

B. Cousançat.—Green foliage; vigorous habit; orange-scarlet flowers.

G. C.

Chrysanthemums.

BEFORE the appearance of the chilly nights of late September it is well to have all Chrysanthemum plants under cover, as the cold nights, following the warm days, check the young growth and prepare the way for mildewed foliage and poor flowers. While it is a wise plan to keep the plants in the open air as long as possible, they should be securely housed in a light and airy structure before there is any possibility of frost, for, although the plants are quite hardy, the young buds are very tender, and often a slight frost, when they are just beginning to show, will ruin a whole crop of flowers. The house should be one that will admit an abundance of light and air, for good plants cannot be grown if either of these is wanting. When placed in the house the plants should have plenty of room—that is, they should not touch each other, but stand so that there may be a free circulation of air about them, and as soon as possible after they are under cover measures should be taken to prevent mildew, which otherwise may spread rapidly, to the great injury of the plants.

The most efficacious means of preventing mildew is fumigating the house with sulphur, but the grower should be warned that he is dealing with a very dangerous element if carelessly handled. Ordinary sulphur when evaporated is not injurious to the plants, but when heated above a certain degree it is converted into a very different thing—sulphurous acid—which is exceedingly destructive to living plants. Our method of applying the sulphur is by evaporating it over a small oil stove in a common two-quart agate-ware stewpan, filled about one-third or one-half full of flowers of sulphur. The wicks of the lamp are so arranged that the sulphur will boil without burning. As long as it does not catch fire it is safe, but the moment it does so the sulphurous acid is formed, and the house will be quickly filled with the choking, irritating gas, and the plants will appear as if they had been scorched by a severe frost. When simply boiled the sulphur is thrown off much like steam, and will crystallize in very minute particles upon every part of the plants, thoroughly eradicating every particle of mildew; and if this is repeated occasionally the plants can be kept entirely free from it.

As soon as the buds get large enough to be easily handled the plants should be disbudded, using a penknife with a small, sharp point. No set rule can be laid down for this operation, but generally speaking the plants set more buds than can be brought to perfection, and the superfluous ones should be removed if large and perfect blooms are wanted. Many varieties will form a full, strong bud at the extreme end of each shoot, with several smaller ones clustered close beneath it. These latter should always be removed in the large-flowered kinds, as they greatly interfere with the development of the bud that is to remain, and when a specimen bloom is wanted, not only these, but every other bud on the branch, should be taken away, so that all the energies of the branch can be devoted to developing the one left at its extremity. Soon after the plants are housed they need stimulating by some quick fertilizer to bring the blooms to perfection and keep the foliage green and fresh. Liquid manure made by leaching stable manure will answer all purposes, and should be applied rather weak, and quite often while the buds are forming. In fact, once a day, when the plants are badly pot-bound, will be none too often if it is applied in a weak state.

Ordinarily, artificial heat will not be needed in the house until the nights become cold enough to freeze or during cold, rainy weather, when a little heat will be found useful in drying the air. *Arthur H. Fewkes.*

Gleichenias

GOOD examples of the various species of this lovely genus of Ferns are not so often seen as they should be, owing in part to the limited stock of some of the species, and consequent high price, and in part to the fact that some difficulty has been encountered by amateur cultivators in persuading them to make a strong and healthy growth. When given proper treatment they soon make exquisite specimens, and wear a more aristocratic air, so to speak, than almost any other class of Ferns, with the possible exception of some of the monarchs of the family, such as the Cibotiums, Alsophilas and Dicksonias. As to what this best treatment should be, there is, perhaps, some difference of opinion, but I will venture to give in outline a treatment which has proved reasonably successful. The soil should be rather coarse and composed of good turfy loam and fibrous peat in about equal proportions, with about one-sixth of coarse sand. A little broken charcoal is a desirable addition to the soil, as it tends to keep it in a more wholesome condition. The Gleichenias being naturally shallow rooters, it is better to grow them in pans than in pots, and, in either case, to give them plenty of drainage, as their roots rarely go deeper than four or five inches below the surface. Good drainage is essential, for, though they like an abundance of water when in full growth, yet they are very impatient of any stagnant moisture at the root. A light syringing over the foliage should be given early in the day, and is beneficial during dry, hot weather, helping to keep the plant clear of thrips. In regard to temperature, the mistake is often made of keeping them (the Gleichenias) too warm, a night temperature of 45° to 50° being quite warm enough for most of the species during the winter season, and in summer they should be kept as cool as possible by shading and plenty of ventilation. The best time to give them a shift in pots is early in the spring, before the growth commences, as, in common with a majority of Ferns, the Gleichenias do not like to have their roots disturbed after the new growth begins. The propagation of this interesting genus is attended with some little difficulty, because most of the species do not produce spores in quantity, and, therefore, division of the rhizomes is the plan adopted to increase the stock, an operation that should be carefully done, so that each piece has as much root as possible attached, else it will be found hard to establish them. As to the best sorts to grow, it may be said that they all are beautiful, but the following are among the most free in habit and easiest to manage: *G. flabellata*, a strong-stemmed and large-fronded species from Australia; *G. dichotoma*, a charming companion plant for the above, its light green pinnæ making a good contrast with the darker tints of its neighbor. Among the finer growing species *G. dicarpa* is, perhaps, the best, closely followed, however, in points of beauty, by *G. Speluncæ*, both of the last named being natives of Tasmania, and all the sorts mentioned are best grown in a cool house, where they will make a much stronger growth, and are not so likely to become infested with insects.

A View in Central Park, Minneapolis.—See page 374.

This list may be extended considerably, but the species named are among the most satisfactory. *W. H. Taplin.*

Orchid Notes.—*Odontoglossum Rœzlii.*—This handsome Orchid is very similar in habit to the beautiful *O. vexillarium*, having longer lanceolate foliage of a much lighter green. It should be grown in a much warmer temperature than the last named species, the warmest end of the Cattleya house with abundant moisture suiting it to perfection. The plants, during growth, require every attention, as thrips often attack them, and when they once infest the Orchid it is difficult to dislodge them. Frequent syringings and dippings once a month in a weak solution of soot and tobacco water, will usually keep the plants free from this pest. When well grown this Odontoglossum will produce its flowers twice a year. These flowers are borne on erect scapes, three to five in number, during the months of March and April, and remain in perfection a long time.

Angræcum Leonii.—This is a native of the Comoro Islands, near Madagascar, and was introduced by M. Leon Humblot, who has already enriched our collections with many choice

and rare species. It was found at a very high elevation, where the atmosphere at all seasons was cool and moist. It is a free flowering species quite distinct in habit, differing entirely from others of the genus, having long, falcate leaves of a leathery texture, from the base of which stout, erect stems are produced, each bearing as many as twelve handsome blossoms of ivory whiteness, with tail-like spurs, measuring from six to nine inches in length. The flowers, which appear in February and March, are very fragrant, and, if removed to cooler quarters, will remain several weeks in beauty. These plants do not enjoy so much heat as the majority of Angræcums, but should occupy a light and airy position in the Cattleya house, and, if suspended in baskets or pans, will be found to thrive and flower freely in a mixture of clean, fresh sphagnum, and a small quantity of rough, fibrous peat.

A. D.

Kniphophia corallina.—This is a free-growing, free-blooming form of *K. Macoweni*. On March 6th of last year (1887) I sowed some seeds of it in a pot in the green-house, and in due time pricked them out into a flat, which I kept in a cold-frame all summer. Last October I transplanted them from the flat into a frame from which frost had been excluded in winter, and thence into rich ground out-of-doors last spring. They made very little growth last year, but they have grown vigorously this summer, and nineteen out of twenty-three are now, or have been, in bloom. As a rule seedling Kniphophias do not bloom till the third year from sowing-time. As nearly all the varieties are highly decorative plants, and especially useful for late blooming, we should treat them tenderly over winter. By mulching them deeply with dry leaves we can preserve them over winter in the open ground, but it is safer to lift them in fall and winter them in a cold pit, cool green-house or cellar. If an increase of some particular variety is desired at lifting time, we may shorten back the long leaves, then divide the crown into as many parts as we can separate with good roots to each, and plant these close together in a frame from which frost is excluded, in the same way as we do with Ehemann's Canna, and plant them out in the open garden in spring.

W. F.

China Asters are among the most useful of garden annuals. They are not only beautiful in form and color, but their lasting qualities add much to their value. The cut flowers do not easily wilt, and revive quickly in water when they do begin to droop. Early flowering China Asters mature much more quickly than the later varieties; but to prolong their lives take up a few of the choicest plants, place in small flower-pots, water well, and keep in the dark for a day, and you will soon have a living bouquet of rare beauty for in-door decoration, giving far less trouble than cut flowers, and remaining fresh and in bloom for weeks. The pots can, of course, be concealed if desired. A plant of Dwarf Bouquet taken up just in time to save it from the frost bloomed last year for five or six weeks, the opening buds often presenting curious variations of color and greater delicacy of tint.

Pittsford, Vermont. *G. A. W.*

The Forest.

Forestry in California.—II.

IN California a number of small tree-plantations have been made, and, I believe, with very satisfactory results. Several small groves of Locust trees have been reported as having proved profitable, the wood being sold for wagons, etc. The only figures I am able to give, however, apply to plantations of the *Eucalyptus globulus*. One case is that of Mr. Robt. C. E. Stearns, of Berkeley, who reports on a plantation of General Stratton, made in 1869; twenty acres were cut when eleven years old, every item of expense was noted, and a rental of $5 per year was charged for the land. The net returns on the twenty acres were $3,866.00. Another case is that of Mr. George A. Nadeau, of Los Angeles.

His figures are:

EXPENSE.

Cost of trees at time of setting, per acre,	$7.50
Labor of replanting, per acre,	5.00
Cultivation, per acre,	5.00
Rental of land for seven years at $3 per acre,	21.00
Expense for seven years, total, per acre,	$38.50

INCOME.

Thirty-five cords of fire-wood per acre, at $3 per cord in the tree,	105.00
Total expense for ninety-seven acres,	$3,734.50
Total return,	10,185.00
Net profits,	6,450.50

California experience shows that tree-planting is profitable within reasonable periods, and gives returns as soon as some orchards, while requiring less care and less first cost.

From these points it will be clear that, looking at the forest in the most commonplace and most narrow practical view, scientific management is both advisable and necessary. Without it, this immense crop of the forests must disappear, to the great detriment of the country.

While these considerations would doubtless be deemed fully sufficient to a business man to warrant a change in our forest policy, looking to the preservation of the woods from waste and fire, and to the maintenance of their natural reproduction to replace the legitimate demand of trade, there are still other reasons of more pressing force which demand forest-preservation. These are the sanitary and climatic influence of forests, and still more their effect on the agricultural productiveness of the country through the precipitation and distribution of moisture controlled by them, and their importance in equalizing the flow of streams and in maintaining springs. The sanitary influence of forests is well understood by investigators. It will be well, however, to give a few illustrations on this point.

The Roman Campagna in ancient times was covered with woods and groves. From it sprang one of the hardiest and most forceful races of the world. We must therefore infer that it was a healthy locality. Since the clearing of this district, and through modern times, the Campagna has been one of the most deadly miasmatic regions of Europe. Within recent years considerable plantations of trees have been made upon its desolate wastes. One of the largest of these was made upon a large estate near Civita Vecchia. The trees were principally Eucalyptus. The amelioration in the health of the locality was prompt. Whereas laborers only remained on the estate in the day and departed to safe places at night, losing much time in traversing the long distance between their work and their shelter, after the growth of the trees they were able to remain with impunity in the district itself. Another plantation on the Campagna was made by the priests at the grand church of St. Paul. The benefit to the health of the fathers was in this case equally marked; the malarial fevers have become less frequent and less deadly.

The Island of Cyprus was formerly celebrated for its luxury and refinement; it contained a large population and was at that time, at least in its mountainous parts, covered with forests. It has been cleared and is now a desolate island of bare rocks, with a few cultivated valleys. It is subject to virulent forms of malarial disease, and contains not a hundredth part of its former population and none of its prosperity. Since the English occupation forest plantations have been commenced on a large scale, but it is too soon to know their effect.

The shores of the Mediterranean show numerous cases similar to these. The island of Mauritius is still another, but we do not have to leave our own country to prove this count. The records of the huntsmen and adventurers who first traveled the wooded western States of America make no mention of malaria as a dreaded malady. The record changed when the settlers came; these cut the trees, and it was then, and only then, that malaria became the scourge to humanity that it is in parts of the United States. While this evidence cannot be held as conclusive, still all experience seems to confirm it. The planting of belts of trees in malarial districts protects localities previously subject to malarial influence. It must be understood, also, in this connection, that the clearings in the western States were a necessity, malaria or no malaria.

Many diseases common in open countries are rare or absent in wooded ones, wherever considerable village populations exist, as in the Black Forest of Germany. The death-rate in the communities of the Black Forest is lower than that of any other part of Germany. Consumption is the disease which, amongst civilized nations, counts the greatest number of victims. In forests this dreadful malady is practically unknown. This fact is now so well recognized by medical men, that they send their patients, even in a climate like that of northern New York, to the Adirondack woods as a cure, to remain not only in summer, but in winter also. The beneficial effects of the Pine forests at Arcahon, in France, and in our southern States, have been availed of in phthisis.

Fog, it is now known by a number of well regulated experiments, is impossible without dust of some kind in the air. In this connection it may be well to call attention to the explanation of our California coast fog. In summer the upper

rents of air are from the coast to the sea. These are charged with dust, which gradually drops out of them, as they lose force on leaving the land. This dust falls into the sea atmosphere, which is charged with moisture, and fog is the result. Fog is irritating to those with weak or defective lungs. In forests this dust, with moisture surrounding it, is sifted out by the foliage, and fogs in forests are always modified, and if the exposure be favorable, are entirely eliminated. Fogs do not occur in dense forests.

Trees all have some odor and many a balsamic and agreeable one. Of such trees the Pines, Firs, Cedars, Eucalyptus and Laurels, Bay and Camphor trees are the best known. The emanations from these have, in general, a sedative effect upon the nervous system, but a stimulating one on the vital functions. These classes of trees are health-giving to the human being, and, to an equal degree, they are fatal to germ life. The importance of this effect will be recognized when we reflect that many diseases are caused and transmitted by germs. Insects will not congregate upon pitch, camphor, myrrh, etc., and the burning of these and many other tree products, as the leaves of Pine or Eucalyptus, stupefies and kills insects and germs. Some vegetable products, as pyrethrum, are more noted and deadly than others.

The philosophy of the attraction that pleasing odors have for man is well worthy of study. The taste or instinct for them is as useful as its complement, the dislike for bad smells, which enables us to avoid infected places.

In the tree the sap mounts from the roots in a crude state, composed of water (oxygen and hydrogen) and a slight admixture of earthy salts; it is carried to the leaf, when it is elaborated by the chlorophyl or minute grains that give the leaves their green color, when carbonic acid is absorbed from the air, and oxygen is liberated from the sap by the decomposition of the carbonic acid. Carbonic acid has a debilitating effect on man, this the tree absorbs; while oxygen is man's life, and this the tree gives.

Trees, while preservative of moisture in dry situations, have a great drying power when moisture is excessive, as in swamps and malarial lands. Few persons realize what an extraordinary amount of moisture a tree is capable of evaporating into the atmosphere. The evaporation takes place through the stomata of the leaves. Of these mouths, 90,000 have been counted on the lower side of the Cherry Laurel leaf, which is devoid of stomates on the upper side; on the leaf of the Lilac 160,000 have been counted. There is a great diversity in this respect amongst plants. The only experiment with which I am acquainted relating to the amount of evaporation which can take place through leaves of trees is that of Marshall Vaillant quoted by J. C. Brown. He took a branch of an Oak and placed it in a vase full of water. He measured the water lost through its leaves and considered himself enabled to conclude that the tree from which this branch had been detached would emit into the atmosphere in twenty-four hours upwards of 2,000 kilogrammes of water, equal to a little more than 5,000 pounds. The abnormal condition under which this experiment was made must cause it to be considered as only an indication of what may take place under normal conditions.

A flow of sap from wounds made in trees for commercial purposes is another indication of this power of taking up water. Pine trees tapped for resin, Camphor trees for camphor Gum and Rubber trees for rubber, show a great flow of sap, but I know of no measure having been taken of it. But measures have been taken of the flow of the Sugar Maple (*Acer saccharinum*) and the yellow Birch (*Betula excelsa*). Emerson cites a Maple six feet in diameter that yielded thirty-one and one-half gallons of sap in twenty-four hours, and Marsh cites one in Warner, New Hampshire, two and one-half feet in diameter, which yielded twenty gallons in eighteen hours; Dr. William cites a large Birch tapped in Vermont, the flow of which was measured from time to time for four or five weeks. The sap ran at the rate of five gallons per hour, progressively diminishing. The total yield was estimated at 1,890 gallons. The flow from these trees was only from one or two auger holes and was insufficient to immediately injure the tree.

When we consider the number of trees which thrive on a single acre we may perceive how important their collective action may become. Trees drain a soil in still another way. Their roots penetrate into the soil and make permeable strata that would otherwise be impervious to water. The channels made by the roots become a means by which surplus water finds its way into substrata, from which it appears later as springs in lower situations. The life activity of plants produces on the oxygen of the air a condition known as ozone. When in this condition oxygen is opposed to germ life, and, consequently, to all forms of putrefaction. From these points it can be understood why a district is healthier in forests than when it is cleared. The more complete the clearing, the more complete the change. There are other beneficial influences of trees on health, some of which are discussed under another head, such, for instance, as their electrical influence, their equalizing tendency on winds and temperature, and their maintaining effect on springs, whereby wholesome water is secured. *Abbot Kinney.*

Correspondence.

Ulmus effusa.

To the Editor of GARDEN AND FOREST:

Sir.—I do not know whether you remember a tree which particularly attracted your notice during your last visit to Berlin. Large, fine and old, it was, nevertheless, no real giant tree, but was attractive through the peculiar form of its head, which, as I was able to tell you, was characteristic of the species, and not merely of the individual. I refer to an Elm on the banks of Lake Tegel, opposite the island of Scharfenberg, which rose tall and lonely from the edge of the wood.

It seems best to retain for this kind of Elm the name of *Ulmus effusa*, which Wildenow gave it in the year 1787, and which appears as the oldest of published names, although that of *U. pedunculata* had been given it by Fougeroux three years previously, and had been read at a meeting of the French Academy of Sciences, but never published. Other synonyms are *U. octandra* and *U. ciliata*. The species belongs particularly to the province of Brandenburg. At least I have never seen such enormous examples in any other part of Germany, or the neighboring countries, as grow on the banks of the Spree and the Havel. The trunk attains the size of an Oak and a far greater height. Specimens seventy or eighty feet in height are not uncommon, and there are some of at least 100 feet. In old age it forms sharp, protruding ribs at the base of the trunk, which have deep concave recesses between them. These natural buttresses evidently greatly increase its power of resisting storms and render effectual help in the struggle for existence. Higher up, the trunk becomes more cylindrical, although always inclined to be irregular, and shows an abundance of young shoots, especially where the tree stands on the edge of a wood. Branching generally begins only at a considerable height. But it is difficult to describe the head, which is a wonder of picturesque beauty, easily surpassing in this respect all other trees in Germany. It must be seen in winter to be fully appreciated, although even at other times it makes a marked impression. The branches bend and twist in the strangest curves, often even more fantastically than those of the Oak. Sometimes they shoot outwards, sometimes bend back, and let the playing light penetrate to the very depths of the head. The higher its crest, the more enchanting is its shape, the more it combines grace with power, the more the slender young shoots contrast with the robust forms of the branches. At last it is a whorl of thin, flexible ramifications that droop and hang somewhat like the branches of the Weeping Willow, although not so low. High up over all, however, tall leaders spring out, which add variety to the top. In short, the shape of the head is almost impossible to describe in words. It is quite different in effect from that of the much more familiar *U. campestris*. Its foliage is the least attractive part of *U. effusa*. It cannot be called beautiful, and if compared, for example, with the glossy foliage of the Linden, has a certain poverty of appearance. The rather large, one-sided and unevenly-toothed leaves are rough to both eye and touch, are not very closely placed, and form a surface of dull, dead green. But seen from a distance these defects do not prevent this Elm, wherever it stands, from being an ornament to the landscape. As with all other species of Elm, its blooming period is very early. Its fruit ripens in the month of May, and is produced in very great profusion, so that its first green in spring is due to the fruit and not to the leaves. The effect is extraordinary. Seen from a distance, the brown masses of hanging blossoms give the illusion of autumn coloring. Then follows the transparent green of the unripe fruit, and the leaves do not finally appear until the fruit begins to ripen and add its shading of brown. Although chickens and other poultry greedily devour the seeds of this Elm, its spontaneous distribution is considerable.

U. effusa belongs exclusively to Middle Europe, Germany forming the centre of its area. In Sweden it is not to be found, nor in Italy, except along the northernmost limits of Lombardy. In its wild state, in the province of Brandenburg, it likes the damp, deciduous woods and the swampy banks of

streams, and especially of lakes, so that Gleditsch appropriately called it the Water Elm. Almost all our village Elms belong to this species, and in such places it is more common than any other tree, and vies in size and beauty with the Linden. It is a pleasure to see these giant trunks, sometimes of enormous circumference, shading the village streets or standing in the farm-yards, and serving as supports for the farmer's tools. In these places the accumulation of animal matter is probably one of the causes of its fine development. Without its Elms a Brandenburg village would hardly be conceivable. They are far too plentiful, however, even the oldest among them, for us to fear any marked decrease in their numbers.

Elm bast was formerly used for tying plants, but has now been superseded by Russian Linden bast, and in many gardens by African Replica (?) bast. Yet it is still used in some villages around Berlin for tying beans to the poles, as it is considered more flexible than any other fibre.

Even Rossmueller, in his celebrated book on "The Forest," confesses never to have seen any variety of *U. effusa*. In this respect it forms a great contrast to *U. campestris*, which is so rich in varieties. A specimen raised and growing in Berlin, however, has parti-colored leaves. Seedlings have also been successfully raised to form pyramidal trees, which remind one of *U. Exoniensis*. Specimens of this sort are to be found in the new public cemetery of Berlin, near Friedrichsfelde.

In measuring the Elms of this species in the province of Brandenburg, I have found the maximum to be a circumference of six to seven metres and a diameter of about two metres. Such dimensions permit the conclusion that the age of these trees reaches back into dim antiquity.

As an avenue tree, for which it has been most successfully used for a long time in this country, it can be warmly recommended to our American friends, more especially as it thrives in very scant soil, provided it is not too dry or too compact.

Scharfenberg, Prussia. *C. Bolle.*

[*Ulmus effusa* has been considered by some botanists a variety of *U. campestris*. Carl Koch, however, whose knowledge of European trees was perhaps unrivaled, agreed with our learned correspondent in believing it to be a distinct species ("Dendrologie," ii. 419). The oldest published name of this tree, antedating by three years that of Willdenow, appears to be *U. lævis*, of Pallas ("Flora Rossica," i. 75, *t.* 48, f. F.), published in 1784.—Ed.]

To the Editor of Garden and Forest:

Sir.—The kind notice of the Onteora Club (the official title of which is "The Catskill Mountain Camp and Cottage Company") in a recent number of your paper tempts me to write you a few words with regard to the condition of the forests in our neighborhood.

The original growth upon this section of the country consisted of large Hemlock trees. These were robbed of their bark some eighty years ago by the tanners from whom Tannersville takes its name, and the ruins of whose long-abandoned and almost forgotten tanneries may still be seen on the banks of the streams in the various ravines of Greene and Ulster Counties. After the tanners had secured all the bark they could utilize, whatever of good lumber was left was secured by lumbermen, who rafted it, where possible, into the Mohawk and Hudson Rivers. The mountain streams have perceptibly diminished in size, undoubtedly owing to the reckless destruction of these large tracts of forest. So many years have passed since this destruction was effected, that a new growth now covers most of the slopes, and there is very little of that nakedness of aspect which so distresses the eye in many parts of the Adirondacks. Yet this new growth is itself in danger of destruction, for many of the mountains are being fast despoiled of their young timber by the chair and furniture factories which now abound in our vicinity. Our woods consist chiefly of Birches, Beeches and Maples, the original Hemlock forest having, in no case, started again in the second growth. The Beeches seem the most hardy and pertinacious, growing in some places in dense thickets so closely that it is impossible to force one's way through them.

It is our intention to look after the trees on our own land as carefully as we can, cutting out all the dead trees, trimming off dead limbs as close to the trunks as possible, and watching the undergrowth with a view to its future as part of the forest. We shall also use our best endeavors to influence local public opinion with regard to forest preservation; and I may note, as a matter of minor interest, that we have already planted long stretches of roadside with shade trees, choosing the indigenous Maples for this purpose. *Dunham Wheeler,*

Supt. "Catskill Mountain Camp and Cottage Co."

115 East Twenty-third Street, New York.

To the Editor of Garden and Forest:

Sir.—Burr Oak grows in the bottoms in this region, but I have never seen it cultivated. Its timber is valuable and we would like to plant it on tree claims, but do not know how to take care of it. Will you kindly inform us? *A. S.*

Jamestown, D. T.

The Burr Oak grows in Dakota. I have examined it on the Red River, the James, and on the Missouri, in Dakota, but from observation and after diligent inquiry, I have learned that it is brittle and of little value compared with Burr Oak timber from further south, where this is quite a rapidly growing tree. In northern Dakota it grows very slowly, much too slowly, where I have noticed it, to make it a profitable tree to plant. Even the acorns of the Burr Oak, near Jamestown, are not as large as hazel nuts, while further south, where this tree is fully developed, the acorns are quite as large as hickory nuts.

Collect acorns as soon as they fall from the tree in autumn, and keep them in moist sand or earth during winter. Sow thickly in drills, and let the seedlings stand one, or not more than two, years, in the drills. Shorten the tap-roots before planting. Many writers claim that tap-rooted trees will never reach their greatest development unless the root is preserved. Experience teaches, however, that the root-pruned tree will soon make a larger and more symmetrical tree than the seedling which has not been transplanted. Examine the stumps of native Oaks ten years old, or those that are fully grown, where they have been extracted by a stump-pulling machine, and you will see that the trees which depended the shortest time on their tap-roots have the best balanced roots, and consequently grew into the best specimens. *Robert Douglas.*

Recent Publications.

The Tuberous Begonia; its history and cultivation. Illustrated. Edited by B. Wynne.

This is the first of a series of popular works upon subjects directly connected with gardening, which the proprietor of the *Gardening World*, a London periodical, announces. The improvement of the Tuberous Begonia is certainly one of the most interesting achievements of modern gardeners. It seems only yesterday since these plants were first made known, and yet the flowers of no other class of plants, perhaps, have ever been so essentially modified and so improved from the florist's point of view at least, in such a short space of time. It was not until 1864 that the first of these plants was discovered in Bolivia by Mr. Richard Pearce, a collector of the Veitches; and it was not until three years later, at the Paris Exposition, that this plant was exhibited and subsequently described as *Begonia Boliviensis*. In 1865 Mr. Pearce discovered, in Bolivia, the yellow-flowered species which bears his name. Two years later this indefatigable and successful collector discovered, in the mountains of Peru, at an elevation of more than 12,000 feet, *Begonia Veitchii*. Unlike *B. Boliviensis*, which has small, drooping, narrow-petaled flowers, the Peruvian plant had flowers much more nearly round in outline, and as the progenitor of the modern varieties with the much prized circular flower, its introduction was important. *Begonia rosæflora*, a native of the Andes of Peru, reached England in 1867. This species, although one of the parents of some of the early varieties, has never played a very important part in the improvement of these plants. *Begonia Davisii*, discovered by a Mr. Davis while collecting in Peru for the Veitches, did not flower in England until 1876, and did not appear in commerce until nine years ago. It is a dwarf species with bright scarlet, erect flowers, and smooth and glossy foliage, characters which, when it is crossed with strains derived from *B. Veitchii* or *B. Boliviensis*, it has succeeded in transmitting to its offspring; and it is said that nearly all the newer single-flowered varieties, as well as the new race of dwarf, upright, double-flowering varieties, owe their best qualities to *B. Davisii*. *Begonia Clarkei* is only known from a plant discovered in an English green-house, but is believed to be originally from Peru. It is less hardy

than the other tuberous-rooted species, and has been little used by the hybridizer.

From these six species, none of which had been seen in European gardens until twenty-one years ago, the whole race of Tuberous Begonias, single and double, is descended. The fact is interesting as showing the influence of one commercial establishment upon modern horticulture, that five of these six species were discovered and introduced into cultivation by collectors of the house of James Veitch & Sons, which has done more than any one single agency in the last fifty years to increase the number of plants cultivated in gardens. The earliest hybrid Begonia was raised in their establishment by John Seden, whose skill as a hybridizer is commemorated in many genera, by crossing *B. Boliviensis* with an unnamed species, it is said. Other varieties soon appeared, and good strains were raised by English and continental growers, and it may be said by American growers also.

It is needless to attempt to describe all the varieties of these plants, or to mention the different crosses to which they owe their origin. This information, and much sound advice about the care and cultivation of these plants and the use to which they can be put, and other information concerning them, will be found in the little book whose title we have given above. Tuberous Begonias have many claims to popularity. The color of their flowers varies from the most intense scarlet to pure white, and to various shades of yellow. The plants are of neat and graceful habit. There is no plant, not even the scarlet Geranium, which, in flower, can produce a more gorgeous mass of color, or that can be used more effectively for certain decorative purposes. A blazing sun will not cause them to wilt, and the severest and most protracted rainstorm will not dim nor destroy the beauty of their flowers. A green-house is not needed to keep them over winter, as tubers enough to plant an acre or two may be stored in a moderate sized drawer. Tuberous Begonias, however, have their drawbacks. As cut flowers they do not last well, as the petals soon fall; they are practically useless for exhibition purposes, because they lose their flowers in traveling. Indeed, when the plants are grown in pots, it is almost impossible to move them about for conservatory or interior decoration. The Tuberous Begonia is essentially a plant which must be let alone, and allowed to remain where it has grown. The plants are now universally popular in England, and are seen everywhere in the great private show-gardens and public nurseries;—where entire ranges of glass houses are devoted to their cultivation, in public parks and in the humblest cottage gardens. In this country, for some not very apparent reason, they are much less frequently grown, and yet the climate is better suited to them than that of England or of any part of northern Europe. The reason may be that we have not yet passed beyond the Scarlet Geranium stage, a disease which seems to have nearly run its course in Europe, or it may be that, as they are not good exhibition subjects, gardeners do not like them, and that, as they are not good for cut flowers, commercial florists cannot make use of them. The American public, at any rate, really know very little as yet of the possibilities in beauty and usefulness of Tuberous Begonias.

Periodical Literature.

In the August number of the *Pharmaceutische Rundschau* (a German periodical published in this city), Dr. Carl Mohr, of Mobile, prints the first of a series of articles on "The Distribution of Plants through the Agency of Animals," a most instructive and interesting chapter, dealing with plant-migrations in the eastern Gulf region of the United States, in so far as they have progressed without conscious action on the part of man.

The district Dr. Mohr's survey includes stretches from western continental Florida to the Mississippi and northward to the limits of the States of Mississippi and Alabama. Here, he says, more than 250 species of plants are known to be foreign intruders among those of native origin. Two-fifths of them have so accommodated themselves to local conditions that they may now be regarded as fully established in their new home. These belong in greater part to the flora of northern Asia and Europe, and in lesser part to that of the Mediterranean region or to the warmer zones of the eastern and western continents. Following in the footsteps of immigration, they remain for the most part confined to the vicinity of settlements, although some of them have spread abroad into the outer wilderness. Many of them are troublesome weeds which, coming from Europe, are now found over the whole of North America, to such a degree that it is sometimes difficult to decide whether they are naturalized or native. Foreign grasses are also found in great variety, some of them having come without visible help from man, while others, like *Sorghum vulgare*, have been first planted and then spread abroad through the agency of birds. Among plants of tropical origin, *Richardsonia scabra* is noted as having spread, in the last forty years, over the whole sandy region near the Gulf, and as now extending into the highland districts of Alabama. This, the Pigeon Weed or Mexican Clover, makes excellent hay, and is a real acquisition to set against many serious nuisances.

Lespedeza striata, the Japan clover, a native of eastern Asia, offers a remarkable instance of rapid migration. First noticed near Charleston towards the end of the fifties, it was found at Macon in 1865, at Augusta in 1867 and at Montgomery in 1868, growing densely on the fields which had lain untilled during the war, and spreading into adjacent uncultivated regions. In 1869 it had reached Mobile County, in Alabama, having made the journey from near the Atlantic coast in a little more than four years. The war prepared the place for it; wandering cattle sowed its seeds in their excrement, and it now furnishes fodder of good quality in large quantities.

The Ailanthus tree of China is fully naturalized in the Gulf region, as is the Cherokee Rose, which, although some observers believe it to be a native, Dr. Mohr declares to be an immigrant from the same country.

Many plants, especially from tropical regions, have been introduced in ballast and cargoes to the neighborhood of coast towns. Some of them have wandered inland and become firmly established; others are still local or even sporadic. Birds and cattle have brought others from western America, some of real value; and birds, again, have brought others from the West Indies, while the track of industry is strewn with immigrants. In Prattville, Alabama, for instance, an interesting colony of Mexico-Texan plants has established itself in the vicinity of a wool factory, their seeds having been brought from the shores of the Rio Grande in the fleeces.

Helenium tenuifolium was first noticed by Dr. Mohr, growing in a street in Mobile, in 1878. Since then it has spread through Mississippi and Alabama northward for two hundred miles, crowding out the native plants and subduing the foreign weeds. Its home is in the Indian Territory and the western parts of Arkansas. It is a pernicious weed, spoiling fodder by its bitter taste; but the same district has sent to the Gulf States the Chicasaw Plum, which is now so thoroughly naturalized that it is often believed indigenous. Its distribution, like that of so many other plants, is attributed, even by the unlearned inhabitants, to the agency of birds.

Of course the interest of Professor Mohr's article is greatly decreased by the necessity we have been under of omitting the catalogues of plants which he gives in great numbers. We can do no more, however, than wish it may be translated entire for the benefit of those who do not read German. It is not only instructive and most interesting in itself, but, as he rightly believes, valuable as illustrating, with definite and varied facts, the manners in which vegetable transmigration has been carried on during countless ages in the past.

Exhibitions.

Window Gardening in Boston.

THE Window Gardening Exhibition at Horticultural Hall, September 15th, was most interesting and instructive as showing the progress of this admirable work. A marked improvement was shown in the condition of the plants as compared with those exhibited in 1887, and the large attendance of visitors and the number of contributors are most encouraging indications of even better results in the future.

Nearly 200 pots and more than 100 collections of cut flowers were on the tables. The display of W. E. Coburn, comprising forty varieties of wild flowers, and arranged with admirable taste, was a marked feature. The plants of nine exhibitors were deemed worthy of special mention as of superior excellence, and there were besides about seventy small gratuities presented to exhibitors.

A slight collation was served at twelve for those whose homes were distant, and was greatly enjoyed by about sixty children, mostly girls. The admirable deportment of the young people was noted by all, and was most gratifying to the Committee, who have given their services to this enterprise with the purpose of refining and elevating the tastes of the young, providing innocent and useful employment and making homes more cheerful and happy.

It may be set down as an educational fact that a child cannot daily care for a plant, study it and watch its development, and learn to love it, without a decided moral and spiritual improvement.

An attractive feature of the exhibition were two microscopic apparatus, contributed by the inventor, Mr. Stiles Frost. This instrument surpasses all others in the ease with which a flower can be observed, magnified and analyzed. It can be put into position and focused almost instantly, and is so simple that a child of ordinary intelligence can use it effectively. These instruments were surrounded by a throng of deeply interested little Bostonians, who could not withhold their cries of delight as they saw a flower, which before, to them, was only a mass of color, distinctly unfold under the glass its exquisite structure, texture and beauty, opening a new realm in the world of flowers.

During the summer there have been several local exhibits in other parts of the city, the most successful being at Orienta Hall, in Roxbury. Perhaps the most important work of the Committee has been in supplying plants to those that wish them.

These are furnished at cost, delivered free at some convenient distributing point. They are specially propagated, and great care is taken that every plant is of superior quality and certain to flower under proper care. *L. M. C.*

Notes.

The second annual exhibition of the Society of Indiana Florists will be held at Indianapolis from the 13th to the 16th of November.

The joint meeting of the American Forestry Congress and of the Southern Forestry Congress will be held at Atlanta, Ga., on November 29th instead of November 12th, as formerly announced.

Harper's Weekly for September 22d contains a four-page illustrated supplement on "Irrigation in the Arid West." The paper was prepared by Richard J. Hinton, and it presents, in a clear and attractive way, the most interesting phases of the great material problem which must soon engage the attention of American legislators.

Some new seedling Gaillardias are mentioned as most promising among the plants in the early September exhibitions in London. The Gaillardia has already become a popular border flower since its great improvement during recent years; but these new varieties are very double and quite distinct from the single sorts. One of them, made up of tubular florets of bright red and gold, is spoken of as most showy.

The students of the Miller Manual Labor School of Albemarle County, Virginia, as a part of their botanical training, have prepared a collection of the native woods of their county, including more than eighty specimens, for the Richmond Exposition. The woods are prepared in blocks, in radial sections, with neat labels, giving the botanical and common name. The extent of the collection illustrates the richness of the forests of the foothills of the Blue Ridge in arborescent species.

Professor Budd, in the recently published report of the Ohio State Forestry Bureau, says, that his experience with the Honey Locust for fence lumber dates back some twenty-five years. Fence rails of that age nailed on posts have outlasted three sets of posts and two sets of Red Oak rails, and the Locust rails are yet mostly good. The rails were split and nailed on in June and July. Posts made from Locust timber, seasoned one summer before setting, and mixed with White Oak posts treated in the same way, lasted equally well.

Of the Viburnums, none are now more showy than the High-bush Cranberry, as its brilliant scarlet fruit lights up its heavy foliage. The neat Arrow-wood (*V. dentatum*) is also at its best now, with its large clusters of blue fruit and its shining leaves. The dwarf *V. cassinoides*, with pink and blue berries among its deep green leaves, makes a good companion for the others, and when planted on rich soil is hardly surpassed by any other shrub of its size. These Viburnums, beautiful during spring and summer in flower, foliage and habit, are doubly useful for the new charm they develop as their fruits ripen in autumn.

A correspondent of *Nature*, writing from Noumea, in New Caledonia, upon the dispersion of seeds and plants, records the fact that thousands of acres of pasture-land have been absolutely ruined on the island by the spread, through the agency of birds, of a species of Lantana, introduced by the first Catholic missionaries sent to the island, as a hedge-plant to surround their property at St. Louis, or Conception. The history of the "*Gendame* plant" is not less interesting. It is an Asclepiad of which a seed was brought to the island from Tahiti by a *Gendame* in his pillow. The *Gendame* shook out his pillow, the seed, with its silky attachment, floated off, fell upon suitable soil, germinated, and now the "*Gendame* plant" has injured the island as much as the missionaries' hedge.

Mr. E. S. Carman, of the *Rural New Yorker*, early this spring undertook to raise Potatoes at the rate of 700 bushels per acre by planting them in trenches. These trenches were eight inches deep and one foot wide. The bottom of the trench was loosened with a prong hoe, and the cut tubers were laid one foot apart in the row. Then a thin layer of soil was placed over them and a dressing of sulphur added to discourage the cut worm. Mapes' potato fertilizer, 880 pounds per acre, was placed below the potatoes and the same amount above. Last week the crop, in five rows each thirty-three feet long and three feet apart, was harvested. The first row yielded at the rate of 684 bushels to the acre, the second at the rate of 605 bushels, the third at the rate of 1,076 bushels, the fourth 299 bushels, and the fifth 253 bushels, the entire plot yielding at the rate of 583 bushels per acre. The Cucumber flea beetle had injured all the tops, and especially those in the last two rows, which were of an early variety.

The managers of the Pennsylvania Railroad recently passed a resolution that all the bridges of short spans on the road should be rebuilt in brick or stone, instead of iron. They were actuated by purely practical considerations relating to the recent increase in the weight of locomotives which the improvements of the past few years have brought about, and the consequent inability of the iron bridges to bear the strains to which they are now subjected. But in commenting upon their resolve, *The American Architect and Building News* rightly says: "Aside from their greater safety, however, bridges of masonry have the æsthetic advantage of being usually interesting and often very beautiful objects, while iron truss bridges have never yet been endowed with anything more than an engineering attraction. The roughest stone arch across a roadway presents a beautiful combination of lines, a fine contrast of light and shadow, and a picturesque effect of landscape beyond, together with an expression of quiet durability which is more needed in our architecture than any other quality. . . . Already our country railway stations, under professional care, are fast becoming transformed from hideous sheds covered with clapboards into charming buildings of stone, picturesque, solid and convenient, often quite richly decorated, and generally surrounded by pretty and well-kept gardens. The better class of these new stations in this country are far more beautiful than those of foreign roads, and if the design of the bridges could be brought up to that of the roads, the line of every well-managed road would furnish a route of considerable architectural interest."

It is well known that a difference in luxuriance of growth shows, not only in the size and shape of plants, but also in their color, individuals which are well nourished being of a darker green than others of the same species which obtain insufficient food. But it is seldom that a knowledge of this fact is turned to good account in so curious a way as has recently been done by a German archæologist, who has recently been excavating the remains of the Roman camp of Carnuntum, near Altenburg, a small town on the Danube between Vienna and Presburg. "It appears," says the London *Times*, "that Professor Hauser, ever on the alert, had for a month past observed the color of an extensive corn-field, which varied in every part. He found an elevated post of observation, and, after a week's close attention, declared it to be his opinion that the corn-field was growing over the site of an ancient amphitheatre. His drawings showed that the oblong centre piece was somewhat concave, and the corn was quite ripe in that part, because there was so much soil between the surface and the bottom of the theatre. Elliptical lines of green, growing paler the higher they rose, showed the seats, and lines forming a radius from the centre showed the walls supporting the elliptical rows of seats. The Professor waited impatiently for the corn to ripen, and the moment it was cut the excavations began. They have shown that the almost incredible suggestion was perfectly correct. Six inches below the soil the top of the outer wall was found, and from there the soil gradually grew thicker until the bottom of the arena was reached, the pavement of which is in perfect condition. From the theatre a paved road leads to the Camp of Carnuntum. As soon as the theatre has been entirely freed of soil covering it, all the measurements will be taken.